

REMARKS

In the current, September 30, 2008 final Office Action, claims 3 - 11 and 13 - 21 were noted as pending in the application, and all claims were rejected. By this response, no claims have been canceled, no claims have been amended, and no new claims have been added. Thus, claims 3 - 11 and 13 - 21 are pending in the application. The rejections of the Office Action are traversed below, and reconsideration of the pending claims is respectfully requested.

Information Disclosure Statement

In item 1, on page 2 of the Office Action notes that the Information Disclosure Statement ("IDS") filed September 8, 2008 is being considered by the Examiner, for which the Applicant expresses his appreciation. The Office Action notes that the citation for reference CL cites 178 pages in the IDS, whereas the Examiner found the document to have only 125 pages. The CL reference is being resubmitted in an IDS herewith, with the correct number of pages (125) listed.

The Office Action also notes that references CAA, CHH, and CII were not found in the IDS. The Applicant is resubmitting these references in an IDS being filed herewith and respectfully requests the Examiner consider these references. The Applicant notes with appreciation that the Examiner has corrected the date (1993) found on the first page of the CII reference.

Rejection of Claims 3 - 11 and 13 - 21 under 35 U.S.C. § 103(a)

In items 3 - 6, on pages 4 - 15 of the Office Action, Claims 3 - 11 and 13 - 21 stand rejected under 35 U.S.C. § 103(a) in view of various combinations of U.S. Patent No. 3,383,614 to Emmons et al.; U.S. Patent No. 5,287,292 to Kenny et al.; U.S. Patent No. 5,255,149 to Matsuo; and U.S. Patent No. 3,843,872 to Shimonmura. This rejection is respectfully traversed.

Under a rejection based on 35 USC § 103(a), the Examiner bears the burden of showing a *prima facie* case of obviousness based upon the prior art: *In re Roufett*, 149 F.3d 1350, 1355, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998); *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992); MPEP § 2142. To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met: (1) the scope and content of the

prior art are to be determined, (2) differences between the prior art and the claims at issue are to be ascertained, and (3) the level of ordinary skill in the pertinent art is resolved. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 86 S.Ct. 684 (1966). Against this background, the obviousness or nonobviousness of the subject matter is determined. *Id.*

When applying Section 103(a), four tenets of patent law must be adhered to: (1) the claimed invention must be considered as a whole; (2) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (3) the references must be viewed without the benefit of impermissible hindsight; and (4) a reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 (Fed. Cir. 1986). Moreover, mere identification of each claimed element in the prior art is insufficient to negate patentability. *In re Rouffet* at 1357. Instead, there “must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor.” *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 536 (Fed. Cir. 1998). Otherwise, sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. *In re Rouffet* at 1357.

An Examiner's analysis concluding that it would have been obvious to combine known elements in the prior art should be made explicit. *KSR Int'l v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)), M.P.E.P. § 2141(III). It is important to identify the benefit/reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed invention does. *KSR Int'l* at 1741, 1744. To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 U.S.P.Q. 580, 582 (C.C.P.A. 1974); MPEP § 2143.03. In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. *In re Rouffett* at 1355.

The Art of Record Fails to Disclose Calculating an Average Temperature from the Plurality of Sensors, as Recited in Independent Claims 3 and 10; and the Art of Record Also Fails to Disclose Calculating an Average Temperature from the Plurality of Different Sensed Temperatures, as Recited in Independent Claims 14 and 20; and the Prior Art Further Fails to Disclose Generating an Interrupt if the Calculated Average Temperature Exceeds a Threshold Temperature Stored in a Register, as Recited in Independent Claims 3 and 14

In item 3, on pages 4 - 6 of the Office Action, independent claims 3 and 14 are rejected in view of the combination of the Emmons and Kenny references. In item 5, on pages 12 - 13, independent claims 10 and 20 are rejected in view of the combination of the Emmons, Kenny, and Shimomura references. Independent claims 3, 10, 14, and 20 recite calculating an average temperature from a plurality of sensors each placed in one of a plurality of different locations on an integrated circuit (claims 3 and 10) and from a plurality of temperatures sensed at a plurality of different locations on an integrated circuit (claims 14 and 20). The Office Action relies on the Emmons reference as allegedly disclosing these features.

The semiconductor device disclosed in Emmons stabilizes the temperature of a semiconductor device by controlling the current through a heat-generating power transistor Q_4 (see Emmons at Col. 1, lines 13 - 14; Col. 2, lines 23 - 27; Col. 5, lines 44 - 60). In particular, the Emmons device relies on a forward voltage drop across diodes $D_1 - D_{14}$ as the temperature of substrate 10, on which the diodes are disposed, increases, thereby increasing the voltage at the base of the Q_1 transistor (see Emmons at Col. 5, lines 30 - 49). This voltage change increases the current through the Q_2 transistor, thereby reducing the voltage at the base of the Q_3 transistor; which in turn reduces the current through the Q_4 power transistor (see Emmons at Col. 5, lines 44 - 53; Fig. 2). The reduction of current through the Q_4 power transistor reduces the power, and thereby the heat, dissipated in the substrate, thereby establishing a temperature equilibrium for the substrate (see Emmons at Col. 5, lines 52 - 57).

Contrary to the assertions of the Office Action, the Emmons reference does not calculate an average temperature, either from a plurality of thermal sensors as required by claims 3 and 10 or from a plurality of different sensed temperatures as required by claims 14 and 20. The Office Action cites to Emmons at Col. 2, lines 10 - 30, where the phrase "average temperature" can be found, as allegedly disclosing this feature. However, Emmons

merely discloses that its system “maintains the average temperature of the control region within a given temperature range,” (see Emmons at Col. 2, lines 25 - 26) and is completely silent regarding any temperature calculations, much less the calculation of an average temperature, as required by independent claims 3, 10, 14, and 20. Instead, the Emmons reference “maintains the average temperature” by achieving an equilibrium temperature through control of the current through the power transistor (see Emmons at Col. 2, lines 23 - 27; Col. 5, lines 52 - 57). In other words, the “average temperature” of Emmons is the temperature within the equilibrium range provided by controlling the current through, and thereby the heat generated by, the power transistor (see Emmons at Col. 5, lines 54 - 73) -- not the calculated average from a plurality of sensors or sensed temperatures as claimed herein.

The Office Action concedes, on page 5, that the Emmons reference fails to teach a register associated with the averaging mechanism recited in independent claims 3 and 14. Presumably, the Office Action is also taking the position that Emmons fails to teach generating an interrupt, as also recited in claims 3 and 14, because the Office Action cites to Kenny on page 6 for this feature. In particular, the Kenny reference is introduced on page 5 of the Office Action to allegedly disclose a register to store a threshold temperature value and to allegedly disclose generating an interrupt if the calculated temperature exceeds the threshold temperature, as recited in claims 3 and 14. The Applicant respectfully disagrees.

Claims 3 and 14 recite a register to store a threshold temperature value. The Office Action appears to equate the counter of Kenny with this claim feature. However, the counter of Kenny is an up/down counter that increments when the CPU speed is fast (such as 33 MHz) and decrements when the CPU speed is slow (such as 1 MHz) (see Kenny at Col. 2, lines 7 - 13). At best, the counter of Kenny is a changing value that is used to control the CPU speed based on previous samplings of the CPU speed (see Kenny at Col. 2, lines 3 - 16) and has nothing to do with storing a threshold temperature value, as required by claims 3 and 14.

The Examiner cites to Kenny at Col. 2, lines 2 - 18 as allegedly showing averaging through a counter. However, Kenny discloses a single temperature sensor (see Kenny at Col. 7, lines 27 - 28) and cannot possibly disclose calculating an average temperature from a plurality of sensors (claim 3) or from a plurality of different sensed temperatures (claim 14). In the absence of a calculated average temperature, Kenny also cannot possibly disclose or

even suggest generating an interrupt if the calculated average temperature exceeds the threshold temperature stored in the register, as recited in claims 3 and 14.

Therefore, neither Emmons nor Kenny discloses calculating an average temperature from the plurality of sensors (as in claims 3 and 10) or from the plurality of different sensed temperatures (as recited in claims 14 and 20); nor do Emmons or Kenny disclose generating an interrupt if the calculated average temperature exceeds a threshold temperature stored in a register (as recited in claims 3 and 14).

The Art of Record Fails to Disclose Displaying Information Regarding a Calculated Average Temperature to a User of an Integrated Circuit, as Recited in Independent Claims 10 and 20

Independent claims 10 and 20 further recite the feature of displaying information regarding the calculated average temperature to a user of the integrated circuit, and claim 10 also recites an interrupt handler for performing this function. The Office Action admits that neither Emmons nor Kenny discloses such features and introduces the Shimomura patent to allegedly disclose these claimed features at Col. 3, lines 45 - 50; Col. 4; Col. 5; and Col. 6, lines 23 - 30. The Shimomura reference is directed to an apparatus for sensing and measuring temperature (see Shimomura at abstract; Col. 1, lines 40 - 43), but is completely silent regarding calculating an average temperature. The cited portion of Shimomura does disclose displaying a decimal number counter (see Shimomura at Col. 6, lines 23 - 28; Col. 10, lines 1 - 7), but the displayed number is related only to a measured temperature, not a calculated average temperature (see Shimomura at Col. 12, line 44 - Col. 13, line 2; Col. 19, lines 34 - 38). Further, Shimomura is directed to measuring temperature with great precision from a single temperature sensor (see Shimomura at abstract; col. 1, lines 40 - 43). Therefore, Shimomura cannot possibly calculate an average temperature from a plurality of thermal sensors (claims 3 and 10) or from a plurality of different locations (claims 14 and 20), and this reference is completely silent regarding such features. Accordingly, Shimomura certainly cannot be said as being able to display information regarding the calculated average temperature, as required by claims 10 and 20.

Therefore, none of the cited references, nor their combinations, disclose displaying information regarding a calculated average temperature to a user of an integrated circuit, as

recited in independent claims 10 and 20, nor do the references or their combinations disclose the interrupt handler recited in claim 10 as displaying such information.

There is No Reason a Person of Ordinary Skill in the Art of Integrated Circuits Would Make the Combination of Art as Suggested in the Office Action

Throughout pages 4 - 6 and 12 - 13, the Office Action asserts with virtually no support that the Emmons, Kenny, and Shimomura references teach each of the elements recited in independent claims 3, 10, 14, and 20 and then concludes that it would have been obvious to combine the teachings of these three reference to render obvious the elements recited in claims 3, 10, 14, and 20. The Applicant respectfully disagrees -- both that the Emmons, Kenny, and Shimomura combinations teach each and every element of independent claims 3, 10, 14, and 20 and further that it would have been obvious to a person of ordinary skill in the art of integrated circuits to make such combinations.

A rejection of obviousness under 35 U.S.C. § 103 requires that the Office Action identify a reason that would have prompted a person, of ordinary skill in the art of the claimed subject matter, to combine the references in the same manner as done in the claims. M.P.E.P. § 2141(III). Also, the Office Action's analysis concluding that it would have been obvious to combine known elements in the prior art must be made explicit. *Id.*

The Applicant notes that the primary reference, Emmons, is directed to a device for stabilizing the temperature of semiconductors (see Emmons at abstract). The stabilization device of Emmons relies on a heat-generated forward voltage drop across diodes D₁ - D₁₄ to effect, through a pairing of transistors, a reduction of current through a heat-generating power transistor, thereby bringing the device into a temperature equilibrium (see Emmons at Col. 5, lines 39 - 57). The Kenny patent is directed to a thermal sensor for monitoring and controlling the temperature of an integrated circuit while in operation by controlling the clock frequency, with a single temperature sensor (see Kenny at abstract; Col. 1, lines 51 - 53; Col. 7, lines 27 - 28). Shimomura is directed to precision measurement of a temperature that can exceed 1,000°C (see Shimomura at abstract; Col. 1, lines 4 - 7 and 23 - 24).

The Office Action asserts that it would have been obvious to combine Kenny with Emmons because "a temperature stabilized semiconductor device . . . is improved by slowing CPU speed to prevent excessively hot and unsafe operating temperatures." However, the

Emmons device already achieves a temperature equilibrium for its semiconductor and does so without requiring any control of the clock frequency of a CPU, as taught by Kenny. In fact, the Emmons device doesn't even require a CPU to operate. There is no reason that a person of ordinary skill in the art of integrated circuits, in possession of the Emmons temperature stabilized device, would look to add the CPU and the clock frequency control of Kenny to accomplish the same results already achieved by Emmons alone. Further, Kenny does not cure the deficiencies of Emmons in that neither reference teaches calculating an average temperature from either the plurality of sensors or the plurality of different sensed temperatures.

The Shimomura references does not bring either the Emmons or the Kenny references, or their combination, any closer to disclosing the claimed invention. Instead, all the Shimomura reference brings to the mix is a device for measuring temperature, a feature already disclosed by Kenny. Therefore, a person of ordinary skill in the art of integrated circuits, in possession of the Emmons/Kenny combination, would have no reason to add the complexity of measuring a temperature, in the manner disclosed by the Shimomura reference, to the Emmons/Kenny combination.

The Examiner is required to explicitly explain the reasons why a person of ordinary skill in the art would have a reason to combine the teachings of the Emmons, Kenny, and Shimomura patents to render the claimed elements obvious. The Office Action fails to explain why a skilled artisan, in possession of the temperature equilibrium semiconductor device of Emmons, would have a reason to add the single temperature sensor teachings of Kenny and Shimomura to allegedly render each and every element of claims 3, 10, 14, and 20 obvious. For example, as described above, there is no showing why a person of ordinary skill in the art could or would combine these three references to teach calculating an average temperature from a plurality of sensors (as recited in claims 3 and 10) or from a plurality of different sensed temperatures (as recited in claims 14 and 20). Without such averaging, no interrupt can be generated if the calculated average exceeds a stored threshold temperature, as recited in claims 3 and 14; and no information regarding the calculated average temperature can be displayed, as recited in claims 10 and 20.

For at least these reasons, independent claims 3, 10, 14 and 20 are believed to be patentably distinguishable over the Emmons, Kenny, and Shimomura references, either taken

alone or in combination. Accordingly, it is respectfully requested that the rejection of claims 3, 10, 14, and 20 be withdrawn.

The Introduction of the Matsuo Reference Fails to Cure the Deficiencies of the Emmons, Kenny, and Shimomura Documents, either Taken Alone or in Any Combination

In items 4 and 6, on pages 9 - 12 and 13 - 15 of the Office Action, dependent claims 6 - 7, 9, 11, 16 - 17, 19, and 21 stand rejected under 35 U.S.C. § 103(a) in view of the combination of the Emmons and Kenny references and further, as regards claim 11, in view of the Shimomura reference. Each of these claims is further rejected in a combination of references including the Matsuo patent.

The Matsuo reference discloses a temperature abnormality detector for an electronic apparatus (see Matsuo at abstract; Col. 1, lines 6 - 9; Col. 2, lines 24 - 29). If a temperature value measured by a selected temperature sensor is not within a predetermined range, the system determines that the selected temperature sensor has failed and switches to another temperature sensor, thereby keeping the element continuously monitored (see Matsuo at Col. 2, lines 40 - 49; Col. 4, lines 38 - 48). While the Matsuo reference discloses a plurality of temperature sensors, this reference fails to remedy the deficiencies of the Emmons, Kenny, and Shimomura references. For example, only one temperature sensor is in use at any time, so the Matsuo cannot disclose sensing temperature at a plurality of different locations, as recited in independent claims 14 and 20. Further, Matsuo fails to disclose calculating an average temperature, as required by independent claims 3, 10, 14, and 20. Additionally, Matsuo does not disclose displaying information regarding the calculated average temperature, as recited in claims 10 and 20.

Therefore, even combining the Matsuo reference to the Emmons/Kenny combination or the Emmons/Kenny/Shimomura combination fails to disclose each and every feature of independent claims 3, 10, 14, and 20.

Each and Every Dependent Claim is Patentable Over the Emmons, Kenny, Shimomura, and Matsuo Documents, Whether Taken Alone or in Combination

Claims 4 - 9 depend from claim 3 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 3, it is submitted that claims 4 - 9 patentably distinguish over the Emmons, Kenny, Shimomura, and Matsuo documents, and withdrawal of the rejection of claims 4 - 9 is respectfully requested.

Claims 11 and 13 depend from claim 10 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 10, it is submitted that claims 11 and 13 patentably distinguish over the Emmons, Kenny, Shimomura, and Matsuo documents, and withdrawal of the rejection of claims 11 and 13 is respectfully requested.

Claims 15 - 19 depend from claim 14 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 14, it is submitted that claims 15 - 19 patentably distinguish over the Emmons, Kenny, Shimomura, and Matsuo documents, and withdrawal of the rejection of claims 15 - 19 is respectfully requested.

Claim 21 depends from claim 20 and includes all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 20, it is submitted that claim 21 patentably distinguishes over the Emmons, Kenny, Shimomura, and Matsuo documents, and withdrawal of the rejection of claim 21 is respectfully requested.

Summary

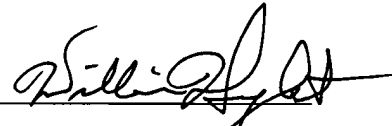
In summary, the Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness against claims 3 - 11 and 13 - 21. More specifically, the Examiner has not shown how or where the prior art teaches or suggests all the claimed limitations. As discussed above, even the combination of the references fails to teach all of the features recited in claims 3 - 11 and 13 - 21. Further, the Examiner has failed to explicitly identify why a person of ordinary skill in the art would combine the Emmons,

Kenny, Shimomura, and Matsuo references together in the manner recited in the pending claims. Accordingly, the Applicant respectfully requests the rejection of claims 3 - 11 and 13 - 21 be withdrawn.

If any fees are required in connection with this Response, please charge such fee to Bingham McCutchen, LLP Deposit Account No. 50-4047.

Respectfully submitted,

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